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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/083,510	02/27/2002	Toru Nakayama	00862.022531.	6494

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EXAMINER	
QIN, YIXING	

ART UNIT	PAPER NUMBER
2625	

DATE MAILED: 05/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/083,510	NAKAYAMA ET AL.	
	Examiner	Art Unit	
	Yixing Qin	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 February 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) *1-12 and 21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1-12 and 21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 February 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

In response to applicant's amendment received 2/6/06, all requested changes have been entered.

Response to Arguments

The main argument is with regards to the direction of the shifting processing performed in the Oda (U.S. Patent No. 5,838,888) invention. The arguments state that the direction of shifting in the Oda invention is in the direction of the printhead scanning (i.e. the main scanning direction), while the shifting direction of the present invention is in the direction in which the print elements are arranged (i.e. sub-scanning direction). The Examiner, however, believes the Oda invention does indeed indicate the shifting direction is in the same direction as being claimed by the applicant. The focus will be on column 4, lines 53-67 and column 5, lines 1-27 of Oda. Specifically, column 5, lines 6-9 disclose that "...the print data in the vertical direction being the sub-scanning direction are read out..." Lines 10-12 disclose that this read out print data distributed to the print controller for transferring data to the print head driver. Lines 21-27 disclose that "[t]he printing controller 43 thus constructed temporarily stores the print data read out from the print buffer 18 and, afterwards, sequentially supplies the print data for each dot to the printing head driver 19, sequentially shifting the print data at the input timing of the printing timing signal (printing clock)." From lines 6-9 above, this print data read

out and shifted is in the sub-scanning direction, which is the same direction in which the print elements are arranged.

This action is made final. Please see the rejection below.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

I. Claims 1-12 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kikuta et al (U.S. Patent No. 5,927,874 – "Kikuta") in view of Oda (U.S. Patent No. 5,838,888).

Claims 1 and 12. Kikuta discloses a printing apparatus in which a carriage equipped with a printhead having a plurality of printing elements arranged in a predetermined direction is made to scan across a printing medium in a direction that intersects the direction in which the printing elements are arranged, thereby performing printing on the medium (Fig. 4) , said apparatus comprising:

Kikuta discloses "a receive buffer for receiving print data that has been transmitted in raster form;"

Kikuta discloses "a print buffer for storing the data which has been stored in said receive buffer, in a plurality of areas corresponding to the a plurality of blocks each

consisting of a predetermined number of successive printing elements;" Kikuta discloses in Fig. 12B and column 11, lines 24-28 a structure comprising of a plurality of print buffers. Essentially, each print buffer in the Kikuta reference is the individual **areas** of the **print buffer** as being claimed. The many print buffers in the Kikuta reference basically functions as the **print buffer** as being claimed. Kikuta discloses in Fig. 11 and column 9, lines 64-67 and column 10 lines 1-30 a description of the functional control of Kituka's invention. Note in column 9 lines 66 the reception buffer and column 10 lines 13-26 of how data is sent to the dot pattern memory 1108. Column 9, line 27 says this dot pattern memory 108 is a can be divided in to many print buffers (i.e. the data in the print buffer corresponds to the data in the reception buffer).

The Kikuta reference discloses a method for printing a document through the use of buffers.

It does not explicitly disclose "data shifting means for shifting in a direction in which the printing elements are arranged, in accordance with printing elements used in the scan, the data in the corresponding area of said print buffer; "transmitting means for transmitting the data shifted by said data shifting means to the printhead in accordance with print timings:" and "control means for establishing correspondence between the areas of said print buffer and respective ones of the blocks in accordance with distance over which the printing medium is transported after the scan, and calculating the amount of the shift."

However, Oda discloses in ~~ex~~ column 4, lines 53-67 and column 5, lines 1-27 of Oda. Specifically, column 5, lines 6-9 disclose that "...the print data in the vertical

direction being the sub-scanning direction are read out..." Lines 10-12 disclose that this read out print data distributed to the print controller for transferring data to the print head driver. Lines 21-27 disclose that "[t]he printing controller 43 thus constructed temporarily stores the print data read out from the print buffer 18 and, afterwards, sequentially supplies the print data for each dot to the printing head driver 19, sequentially shifting the print data at the input timing of the printing timing signal (printing clock)." From lines 6-9 above, this print data read out and shifted is in the sub-scanning direction, which is the same direction in which the print elements are arranged.

Oda further discloses in column 5, lines 10-26 that "...The printing controller 43 is provided with a parallel-to-serial converter 51 that transfers the print data for each dot to the printing head driver 19 in a serial format at the input timing of a transfer clock, a 4-bit shift register unit 52 (storing means) that has 64 channels of a 4-bit shift register so as to distribute the print data of the entire channels (64 channels) for each dot to the parallel-to-serial converter 51, and a data selector 53 that distributes the print data for each dot to each of the shift registers of the 4-bit shift register unit 52. The printing controller 43 thus constructed temporarily stores the print data read out from the print buffer 18 and, afterwards, sequentially supplies the print data for each dot to the printing head driver 19, sequentially shifting the print data at the input timing of the printing timing signal (printing clock)."

Kikuta and Oda are combinable because they are both in the art of speeding up printing.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have combined the Kikuta and Oda inventions to include a data shifting means or step

The motivation would have been to increase the amount of print data that can be transferred/processed in a given period of time.

Claim 2. Kikuta discloses "The apparatus according to claim 1, wherein each area of said print buffer stores data to be supplied to printing elements of the predetermined number in one scan." (in Fig. 4 and column 5, lines 48-55 - one print buffer contains information used for printing in one scan.)

Claim 3. Kikuta discloses "The apparatus according to claim 1, wherein said control means has a table indicating correspondence between the areas of said print buffer and respective ones of the blocks, and said table is updated after each scan." (column 5, lines 32-45 and Fig. 3 - the idea of a management table 203 that stores information about print buffers, and gets updated when print buffers obtain data or are cleared.)

Claim 4. Kikuta discloses "The apparatus according to claim 1, wherein the plurality of areas of said print beer is at least twice the number of blocks." (column 5, line 45 that their embodiment uses 150 print buffers and further goes to explain in column 5 , lines 56-63 that their management system has enough buffers for two scannings. This means the number of print buffers is at least twice the number of blocks.)

Claim 5. Kikuta discloses "The apparatus according to claim 1, wherein a flag indicating status of use is provided for each area of said print buffer." (column 5, lines 41-45 that the print buffer management table has flags for indicating print buffer usage.)

Claim 6. Kikuta discloses "The apparatus according to claim 1, further comprising print- buffer management means for performing management in such a manner that each area of said print buffer is used cyclically in a predetermined order." (Fig. 4 of Kikuta shows areas 1-N, and they are used in a predetermined order – see column 6, lines 13-24.)

Claim 7. Kikuta discloses "The apparatus according to claim 1, wherein a plurality of printheads are mounted on the carriage and each of these printheads performs color printing by printing colors that differ from one another." (Fig. 7 shows a printhead with different colors.)

Claim 8. Kikuta discloses "The apparatus according to claim 7, wherein a plurality of said print buffers are provided in association with each of the printheads." (Fig. 9 - a plurality of print buffers for each printhead color.)

Claim 9. Kikuta discloses "The apparatus according to claim 1, wherein when multiple-pass printing in which each print area is printed by a plurality of scans is performed, transport distance of the printing medium is capable of being set pass by

pass." (Fig. 5 and column 6, lines 35-39 the idea of moving the medium by a determined width in order to print properly.)

Claim 10. Kikuta discloses "The apparatus according to claim 1, wherein the printing head is an ink-jet printing head which performs printing by ejecting ink." (Fig. 1 an ink-jet printer.)

Claim 11. Kikuta discloses "The apparatus according to claim 10 , wherein the printhead ejects ink by utilizing thermal energy, said printhead having a thermal energy transducer for generating thermal energy applied to the ink." (column 9, lines 38-42 "[a]n electrothermal transducer for generating thermal energy is provided at each ink channels corresponding to the respective nozzles, and electrode wiring for supplying electricity to the electrothermal transducer is also provided there.")

Claim 21. Kikuta discloses "The apparatus according to claim 1, wherein said control means establishes said correspondence based on an extent of the printing elements used for printing." (Fig. 4 and column 5, lines 48-63, especially lines 56-63."

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yixing Qin whose telephone number is (571)272-7381. The examiner can normally be reached on M-F 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Twyler Lamb can be reached on (571)272-7406. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

YQ

TWYLER LAMB
~~PRIMARY~~ EXAMINER
Supervisory Patent